Amendments to the claims

The following listing of claims replaces all previous listings of claims.

1. (Currently amended) A device for duplicating and characterizing nucleic acids in a reaction chamber, comprising:

a chamber body containing an optically permeable chip having a detection area with an optically permeable zone of detection, the detection area being adapted to immobilize at least one of nucleic acid molecules, peptides, and proteins; and

an optically permeable chamber support on which the chamber body is sealingly placed to form a cavity including:

(i) a capillary gap between the chamber support and the detection area of the chip, and

(ii) a gas reservoir laterally offset from and in liquid communication with the capillary gap; and

an inlet by which liquid sample can be introduced to the cavity;

wherein:

the capillary gap has a height along an axis perpendicular to the detection area of the chip,

the gas reservoir has a height along the axis that is greater than height of the capillary gap, and

~~the capillary gap being temperature-adjustable and flow-controllable, and wherein~~ the capillary gap forms a single reaction chamber that is adapted to amplify and characterize nucleic acids therein.

2. (Previously presented) A device according to claim 1, further comprising a temperature adjustment means connected with the chamber support and adapted to permit a rapid temperature control the capillary gap.

3. (Previously presented) A device according to claim 2, wherein the temperature adjustment means are situated on a side of the chamber support facing towards the chamber body.

4. (Previously presented) A device according to claim 2, wherein the optically permeable zone of detection includes detection spots; and

wherein the temperature adjustment means are configured such that the optical transparency of the chip remains unaffected at least at the detection spots.

5. (Previously presented) A device according to claim 4, wherein the temperature adjustment means comprise micro-structured heating elements.

6. (Previously presented) A device according to claim 1, wherein the optically permeable zone of detection includes detection spots;

wherein the chamber support comprises systems for thoroughly mixing a liquid sample, the systems being configured such that the chip remains optically transparent at least at the detection spots; and

a quadrupole system, adapted to induce an electro-osmotic flow, is associated with the chamber support.

7. (Previously presented) A device according to claim 6,
wherein the quadrupole system includes gold-titanium electrodes.

8. (Previously presented) A device according to claim 1,
wherein the chamber support and the chamber body consist of at least one of glass, synthetic material, and optically permeable synthetic materials.

9. (Previously presented) A device according to claim 1,
wherein the chamber support consists of a thermally conducting material.

10. (Previously presented) A device according to claim 1,

wherein the chip consists of optically permeable materials including at least one of glass, borofloat glass, quartz glass, monocrystalline CaF_2, sapphire, PMMA and silicon.

11. (Previously presented) A device according to claim 1,

wherein the chamber body comprises an optically permeably conical recess in the detection area of the chip.

12. (Previously presented) A device according to claim 1,

wherein the chamber body includes an inlet and an outlet spatially separate from each other, for charging the capillary gap.

13. (Previously presented) A device according to claim 12,

wherein the inlet and the outlet are arranged unilaterally to the chip and are separated by a gas reservoir nose.

14. (Previously presented) A device according to claim 1,

wherein the chamber body is sealingly and unreleasably connected with the chamber support by at least one of an adhesive and weld connection.

15. (Previously presented) A device according to claim 1,

wherein the detection area is configured in the form of spots, onto which probes in the form of nucleic acid molecules are immobilized.

16. (Previously presented) A device according to claim 15,

wherein the probes are immobilized through spacers.

17. (Previously presented) A device according to claim 1,

wherein the detection area is configured in the form of spots, onto which probes in the form of at least one of peptides and proteins are immobilized.

18. (Previously presented) A device according to claim 1,

wherein the capillary gap is adapted to allow characterization by at least one of optical detection and spectroscopy.

19. (Previously presented) A device according to claim 1,

wherein the chip is adapted to allow characterization by a silver precipitation reaction.

20-24. (Canceled)

25. (Currently amended) A device for duplicating and characterizing nucleic acids, comprising:

a chamber support;

a chamber body including an optically permeable chip, the chamber body placed on the support to form a cavity including:

(i) a capillary gap between the chamber support and the chip, and

(ii) a gas reservoir laterally offset from and in liquid communication with the capillary gap; and

an inlet by which liquid sample can be introduced to the cavity;

wherein:

the capillary gap has a height along an axis perpendicular to the chip,

the gas reservoir has a height along the axis that is greater than height of the capillary gap; and

~~a capillary gap intermediate the chamber support and the chamber body,~~ the capillary gap being adapted to act as a single chamber for both reaction and characterization of nucleic acids.

26. (Currently amended) The device of claim 25, wherein at least a portion of the gas reservoir is positioned between the inlet and the capillary gap ~~the chamber body includes an optically permeable chip so that optics can impinge a sample in the capillary gap~~.

27. (Previously presented) The device of claim 26, wherein the optically permeable chip includes a detection area that includes immobilized probes within the capillary gap.

28. (Previously presented) The device of claim 27, wherein the immobilized probes include at least one of nucleic acid molecules, peptides and proteins.

29. (Previously presented) The device of claim 27, wherein the detection area is optically permeable.

30. (Previously presented) The device of claim 25, wherein the capillary gap is temperature-adjustable and flow-controllable within the capillary gap.

31. (Previously presented) The device according to claim 5, wherein the micro-structured heating elements include nickel-chromium thick film resistance heaters.

32. (Previously presented) The device according to claim 4, wherein the temperature adjustment means include microstructured temperature sensors.

33. (Previously presented) A device according to claim 32, wherein the microstructured temperature sensors include nickel-chromium thick film resistance sensors.

34. (Previously presented) The device according to claim 1, wherein at least one of the chamber support and the chamber body include an optically permeable synthetic material selected from the group consisting of nylon, Teflon, topaz, polycarbonate, polystyrene, PMMA and polymethane ethyl acrylate.

35. (Previously presented) A device according to claim 1, wherein the chamber body further includes an additional sealing surface adapted to releasably connect to the chamber support.

36. (Previously presented) A device according to claim 15, wherein the nucleic acid molecules include at least one of DNA molecules and RNA molecules.

37. (Previously presented) A device according to claim 36, wherein the probes are immobilized through spacers.

38. (Previously presented) A device according to claim 17, wherein the at least one of peptides and proteins include at least one of antibodies, receptor molecules, hormones and pharmaceutically active peptides.

39. (Previously presented) A device according to claim 18, wherein the at least one of optical detection and spectroscopy includes at least one of transmitted-light fluorescence measurement, dark field fluorescence measurement, confocal fluorescent measurement, reflected-light fluorescence measurement, photometry and differential photometry.

40. (Previously presented) The device of claim 1, wherein the capillary gap is adapted to provide almost simultaneous performance of a chip-based characterization and at least one reprocessing reactions and conditioning reactions.

41. (Previously presented) The device of claim 40, wherein the capillary gap is adapted to amplify nucleic acids by PCR.

42. (Previously presented) The device of claim 40, wherein the capillary gap is adapted to perform a reverse transcription of RNA to DNA.

43. (Previously presented) The device of claim 40, wherein the capillary gap is adapted to perform a digestive process of nucleic acids by means of restriction enzymes.

44. (Currently amended) A device for duplicating and characterizing nucleic acids, comprising:

a chamber support;

a chamber body ~~on the support, the chamber body~~ including an optically permeable chip, a sample inlet and a sample outlet, placed on the support to form a cavity including:

(i) a capillary gap between the chamber support and the chip, and

(ii) a gas reservoir laterally offset from and in liquid communication with the capillary gap;

wherein:

the capillary gap has a height along an axis perpendicular to the chip,

the gas reservoir has a height along the axis that is greater than height of the capillary gap; ~~and~~

~~a capillary gap intermediate the chamber support and the chamber body and connected to the sample inlet and the sample outlet,~~ the capillary gap ~~consisting~~ consists of a single chamber for both reaction and characterization of nucleic acids such that only the single chamber holds the nucleic acids for both reaction and characterization, and

~~wherein~~ the sample inlet and sample outlet are connected only to the single chamber.

45. (Previously presented) The device of claim 44, wherein the capillary gap includes means for reacting a sample and means for characterizing the sample.

46. (Currently amended) The device of claim 44, wherein at least a portion of the gas reservoir is positioned between the inlet and the capillary gap ~~the chamber body includes a gas reservoir connected to the capillary gap for receiving gas bubbles from the capillary gap and forming a thermal insulation around a sample of the nucleic acid in the capillary gap~~.

47. (Previously presented) The device of claim 44, wherein the single chamber is free of fluid channels to move the nucleic acids to a subsequent reaction and characterization chamber.